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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MORAN, MARJORIE A

ART UNIT

PAPER NUMBER

1631

DATE MAILED: 11/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/601,327

Applicant(s)

OCCHIPINTI ET AL.

Examiner

Marjorie A. Moran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 August 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) 1,2 and 22-37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

***Election/Restrictions***

Claims 1-2 and 22-37 are again withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 1/3/06.

This application contains claims 1-2 and 22-37 drawn to an invention nonelected with traverse in a paper filed 1/3/06. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

***Priority***

Applicant is thanked for kindly providing a copy of EP 1376606A1, and for stating that the EP document is an accurate English translation of priority document for the instant application. Priority is hereby granted to the filing date of the priority document, 6/20/2002.

***Claim Objections***

Claims 4, 9, 12, and 14-21 are each objected to because of the following informalities: the claims recite the phrase "wherein it" which refers back to "the method according to claim ..." The examiner interprets the grammatical antecedent of "it" to be the parent claim, but the phrasing is awkward. For better clarity, the examiner

recommends replacing the phrase "wherein it further comprises" or "wherein it comprises" with --further comprising-- in each claim. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant's arguments filed 8/9/06 have been fully considered but they are not persuasive. Arguments are addressed as they pertain to the rejections below. Any rejections made under 35 USC 112 not reiterated below are hereby withdrawn.

Claim 3 recites "using" DNA strands in line 3 and "using" carbon nanotubes in line 4. Claim 5 recites "using" DNA strands. Claim 10 recites "using" a functional group. It is unclear what active method step or steps are intended to be encompassed by the "using" limitations recited, therefore claims 3, 5 and 10 are indefinite. Applicant argues that the instant specification makes the intended steps clear. In response, it is noted that while the claims are read "in light" of the specification, the specification may not be "read into" the claims. With regard to claim 3, the steps argued by applicant as a "use" of DNA strands and carbon nanotubes, which are disclosed in paragraphs 68 et seq and in Figures 14-19, are not reflected in the claims. For example, claim 3 does not recite addressable memory cells nor assembly of any sort of array nor any limitation with

regard to molecular wires, etc. It is still unclear what active method step or steps are intended to be encompassed by "using" DNA strands and carbon nanotubes, as recited in claim 3, therefore the examiner maintains that claim 3 is indefinite. It is noted that claim 5 explicitly limits the steps of making memory elements and connection elements, therefore claims 5-15, 17, 20 and 21 are not indefinite for this reason. However, claims 4, 16, 18, and 19 depend from claim 3 and do NOT clarify the intended steps, and are indefinite for this reason.

Specifically with regard to claim 10, it is still unclear what step or steps are intended to be encompassed by a "use" of a functional group, as recited in claim 10. For example, does applicant intend to attach the functional group directly to the nanotubes? Or is some other moiety added to the nanotubes via a functional group, wherein the functional group acts as a cross-linker? Or is some other step/limitation intended? For this reason, the examiner maintains that claim 10 is indefinite. Claims 11, 12, 14 and 15 depend from claim 10 and are therefore also indefinite.

Specifically with regard to claim 5, it is noted that a step of contacting first nanoelectrodes and nanotubes "using" DNA strands may be interpreted to mean "contacting nanoelectrodes and nanotubes with DNA strands"; OR may mean "connecting nanoelectrodes to nanotubes via DNA strands." It is noted that in the first instance, no connection between all three elements is required, whereas in the second instance, the DNA strands connect the other two elements to each other. As it is still unclear what step or limitation is actually intended by "using" DNA strands, the rejection

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is maintained. Claims 6-15, 17, 20 and 21 depend from claim 5 and are therefore also indefinite for this reason.

Claim 3 recites the phrase "and connection elements..." in lines 3-4. It is unclear what previous limitation or step is intended to comprise "and connection elements..."; i.e. creating a molecular memory as in lines 2-3, or the step of making memory elements as in line 3, or "using" DNA strands, also in line 3, the claim is indefinite. Applicant has neither amended the claims nor presented arguments to overcome this rejection, therefore the rejection is maintained.

Claim 4 recites a step of "hybridizing...DNA strands", but does not recite what they are to be hybridized with or to. However, in light of applicant's arguments on page 11 of the response, the claim is interpreted to be reciting hybridization of DNA strands in the device to complementary strands of DNA.

Claim 5 recites hybridizing or not hybridizing DNA "according to" information that is to be stored. The terminology used is confusing. Applicant argues that based on the disclosure of the specification, one skilled in the art would understand that DNA is to be hybridized or not hybridized in order to achieve a desired RESULT, i.e. to manufacture a particular "memory state." However, the phrase "according to the information that is to be stored" implies that one hybridizes or not hybridizes based upon specific information or data to be input; i.e. based on the INPUT. It is therefore still unclear what is intended by the phrase by the step of hybridizing or not hybridizing "according to the information that is to be stored," therefore the rejection is maintained. Claims 6-15, 17, and 20-21 depend from claim 5 and are also indefinite for this reason.

Claim 8 recites the phrase “, making use of a manipulator”. It is unclear what step or steps are to be performed “making use of a manipulator”, therefore the claim is indefinite. For example, it is unclear whether the “use” of a manipulator is a separate step from that of arranging individual nanotubes, or whether the step of arranging nanotubes is intended to be one performed by a manipulator, or whether the entirety of claims 5 and 8 (and possibly parent claim 3) are to be performed with a manipulator. Applicant argues in the response that on page 13 that “use of a manipulator” is a “possible alternative to other methods for forming the carbon nanotubes” but does not clarify which of the many steps disclosed in paragraphs 83-93 or recited in the claims are intended to be those actually performed by the manipulator. As the limitation(s) intended are still unclear, the rejection is maintained. Clarification through clearer claim language is requested.

Claim 11 limits a functional group to be one which “derives from” benzyne. Claim 11 further recites “derivatives” of benzyne. It is unclear what limitation of benzyne or the functional group is intended. The specification does not define a “derivative” and one skilled in the art would not know the metes and bounds intended by applicant for a “derivative” of benzyne, therefore claim 11 is indefinite. In the response filed 8/9/06, applicant provides an example and states that, based on the example, and the disclosure for how to functionalize nanotubes, one would (presumably) know what derivatives of benzyne are intended. Applicant is reminded that limitations from the specification may not be read into the claims, and is further reminded that the rejection is one of indefiniteness, not one of lack of enablement. The issue is not whether one

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skilled in the art would know how add a benzyne to a carbon nanotube; the problem is that one skilled in the art does not know what metes and bounds are intended by APPLCIANT as a derivative of benzyne. As the limitation intended is still unclear, the rejection is maintained.

Claim 13 limits functionalization to "be performed locally." It is unclear what is intended to be "local" on a nanotube, therefore claim 13 is indefinite. Applicant argues that the term is understood by those in the art, but fails to provide evidence for this conclusion or concrete examples to support that the term is commonly known and understood in the art to have a particular meaning with regard to nanotubes. The claims are not directed to use of nanolithography tools or microscopy tools. The examiner has searched the prior art with regard to nanotubes and manipulation/derivitization thereof, but did not find any particular definition or common usage of the term "local" as applied to derivitization of nanotubes. As it is still unclear what is intended by performing functionalization "locally" on nanotubes, the rejection is maintained.

Claim 17 recites "contacting" first nanoelectrodes and DNA strands, but does not recite what the electrodes and DNA are to be contacted WITH. To elucidate, it is unclear whether the nanoelectrodes and DNA strands contact EACH OTHER, or are contacted BY some other element of the memory device. See also, the rejection of claim 5 with regard to "using" DNA strands, above. Applicant simply argues that claim dependency has been changed and that the meaning of the word "contacting" should be clear from the context. As previously set forth, it is clear that the nanoelectrodes and DNA strands are to contacted with *something*, but the context renders the claim

indefinite as it is unclear what they are to be contacted with. As the limitation intended by applicant is still unclear, the rejection is maintained.

Claim 21 recites the limitation "said array of second nanoelectrodes" in line 3, and the term "the amide bond" in line 4. There is insufficient antecedent basis for these limitations in the claims. Parent claim 5 recites only a single step of forming an "array of first nanoelectrodes," but does not recite "an array of second nanoelectrodes", nor does claim 5 recite an amide bond.

Claim 21 recites "contacting" hybridized DNA strands and non-hybridized DNA strands, but does not recite what the different DNA strands are to be contacted WITH; i.e. each other or some other element of the memory device. As the limitation intended by applicant is still unclear, the rejection is maintained.

### ***Conclusion***

Claims 3-12 are rejected; claims 1-2 and 22-37 are again withdrawn.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marjorie A. Moran whose telephone number is (571) 272-0720. The examiner can normally be reached on Monday-Friday; 6 am-2:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Wang can be reached on (571)272-0811. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Marjorie A. Moran  
Primary Examiner  
Art Unit 1631

*Marjorie A. Moran*  
10/30/06